

## ABSTRACT

**Mobile Cellular Radio**

A moveable switching system provides a cell, or small network of cells,  
 5 which moves with the aircraft or other vehicle on which it is located, but whose  
 operation appears to the user as an ordinary fixed base station of the "host" network  
 to which it is connected. A cellular mobile switching centre 16, on board the  
 aircraft, detects a call attempt or registration attempt from a mobile unit 10 and  
 generates a temporary onboard identity for association with the mobile identity code.  
 10 The temporary onboard identity code is associated with a node of the onboard part of  
 a satellite communications system. The code is returned to the onboard MSC 16  
 which sets up a call over a satellite system 13,6,3 to the MSC 41 of a host network  
 4.

When such a call is received from the satellite ground station 3 the host  
 15 MSC 41 routes the call to an interface unit 48 which retrieves the identities of the  
 cellular telephone and the onboard terminal. The cellular identity is passed to a  
 network registration unit 45 to allow a location update to allow calls to the cellular  
 telephone 10 to be routed to the mobile station 41. Consequently, any incoming calls  
 intended for the mobile user will now be directed to the network 4, as the mobile  
 20 user is currently registered there.

The interface unit 48 also passes the temporary onboard identity code to a  
 call diversion instruction unit 46, which generates a "divert on busy" instruction to  
 the VLR 44 (step 615). This causes any calls for the cellular telephone 10 received  
 by the host MSC 41 to be diverted via the satellite link 3, 6,13 to the node indicated  
 25 by the temporary onboard identity code, where the call is routed to the onboard MSC  
 16 and the code re-translated back to the cellular identity code to allow connection  
 to the cellular telephone 10.